What is claimed is:

1. A method of making a magnetic material comprising the steps of:

providing a molecule comprising a portion that binds specifically to the surface of a magnetic material; and

contacting one or more magnetic material precursors with the molecule under conditions that permit formation of the magnetic material.

2. The method according to claim 1, wherein the magnetic material is a particle.

3. The method according to claim 1, wherein the magnetic material is a nanoparticle.

4. The method according to claim 1, wherein the magnetic material is a ferromagnetic material.

5. The method according to claim 1, wherein the magnetic material is a ferromagnetic nanoparticle.

6. The method recited in claim 1, wherein the molecule comprises an amino acid oligomer as the portion that binds specifically to the surface of the magnetic material.

7. The method recited in claim 6, wherein the oligomer is between about 7 and about 100 amino acids long.

8. The method recited in claim 6, wherein the oligomer is between about 7 and about 20 amino acids long.

9. The method recited in claim 1, wherein the molecule is selected from a combinatorial library screen.

10. The method recited in claim 7, wherein the magnetic material comprises Co, $SmCo_5$, CoPt or FePt.

11. The method recited in claim 1, further comprising the steps of isolating the magnetic material.

12. The method recited in claim 11, wherein the magnetic material is attached to a substrate.

13. The method recited in claim 1, wherein the molecule is defined further as peptide that comprises a portion of a self-assembling molecule.

14. The method recited in claim 13, wherein the self-assembling molecule is a phage.

15. The method recited in claim 13, wherein the self-assembling molecule is grown in a bacterium.

16. A method of making a magnetic material comprising the step of:

contacting a molecule that initiates magnetic material formation with magnetic material precursor and a reducing agent.

17. The method recited in claim 16, wherein contacting is carried out at about room temperature.

18. The method recited in claim 16, wherein contacting is carried out at about 350°C or less.

19. The method recited in claim 16, wherein the molecule is an amino acid oligomer.

20. The method recited in claim 16, wherein the molecule is an amino acid oligomer comprising between about 7 and about 100 amino acids.

21. The method recited in claim 16, wherein the molecule is an amino acid oligomer comprising between about 7 and about 20 amino acids.

22. The method recited in claim 16, wherein the molecule further comprises a self-assembling viral particle.

23. The method recited in claim 16, wherein the magnetic material comprises Co, CoPt, SmCo5, or FePt magnetic material.

24. The method recited in claim 16, wherein the magnetic material is a magnetic quantum dot.

25. The method recited in claim 22, wherein the self-assembling viral particle is used to produce a casting film.

26. The method according to claim 16, wherein the magnetic material is a particle.

27. The method according to claim 16, wherein the magnetic material is a nanoparticle.

28. The method according to claim 16, wherein the magnetic material is a ferromagnetic material.

29. The method according to claim 16, wherein the magnetic material is a ferromagnetic nanoparticle.

30. A magnetic material made by the method of claim 1.

31. A magnetic material made by the method of claim 16.

32. A method of making a magnetic material comprising the steps of:

linking a magnetic material binding molecule to a substrate;

contacting one or more magnetic material precursors with the magnetic material binding molecule under conditions that form the magnetic material; and

forming the magnetic material.

33. The method according to claim 32, wherein the magnetic material is a ferromagnetic material.

34. The method according to claim 32, wherein the magnetic material is a particle.

35. The method according to claim 32, wherein the magnetic material is a nanoparticle.

36. The method according to claim 32, wherein the magnetic material is a ferromagnetic nanoparticle.

37. The method of claim 32, wherein the magnetic material binding molecule comprises a chimeric protein that exposes one or more magnetic material binding amino acid oligomers on its surface.

38. The method of claim 32, wherein the magnetic material binding molecule is an amino acid oligomer.

39. The method of claim 32, wherein the magnetic material binding molecule comprises between about 7 and about 100 amino acid oligomers.

40. The method of claim 32, wherein the magnetic material binding molecule comprises between about 7 and about 20 amino acids.

41. The method of claim 32, wherein the magnetic material binding molecule is linked chemically to the substrate.

42. The method of claim 32, wherein the magnetic material binding molecule comprises a chimeric protein with a self-assembling viral particle.

43. The method of claim 32, wherein the magnetic material comprises Co, CoPt, $SmCo_5$ or FePt.

44. The method of claim 32, wherein the method is used to produce a film.

45. The method of claim 32, wherein substrate comprises a patterned surface, and the magnetic material binding molecule is fixed only on the patterns of the patterned surface.

46. A magnetic material made by the method of claim 32.

47. A magnetic material formed using a binding molecule and one or more magnetic material precursors.

48. The magnetic material according to claim 47, wherein the binding molecule comprises a binding amino acid oligomer portion.

49. The magnetic material according to claim 48, wherein the oligomer comprises between about 7 and about 100 amino acids.

50. The magnetic material according to claim 48, wherein the binding oligomer portion comprises between about 7 and about 20 amino acids.

51. The magnetic material according to claim 47, wherein the magnetic material is a ferromagnetic material.

52. The magnetic material according to claim 47, wherein the magnetic material comprises particles.

53. The magnetic material according to claim 47, wherein the magnetic material comprises nanoparticles.

54. The magnetic material according to claim 47, wherein the magnetic material comprises ferromagnetic nanoparticles.

55. The magnetic material of claim 47, wherein the magnetic material is formed at a temperature of less than 350 degrees centigrade.

56. The magnetic material of claim 47, wherein the magnetic material is selected from the group consisting of Co, CoPt, SmCo5, and FePt.

57. A magnetic material formed using a magnetic material specific binding molecule in the presence of a metal salt and a reducing agent.

58. The magnetic material according to claim 57, wherein the material is a ferromagnetic material.

59. The magnetic material according to claim 58, wherein the material is a ferromagnetic nanoparticle material.

60. The magnetic material according to claim 59, wherein the binding molecule comprises a binding amino acid oligomer portion.

61. A composition comprising peptide that binds specifically to ε-Co.

62. A composition according to claim 61, wherein the peptide binds specifically to a crystalline surface of ε-Co.

63. A composition according to claim 61, wherein the peptide binds comprises the sequence of ALSPHSAPLTLY (SEQ ID NO.:15).

64. A composition comprising peptide that binds specifically to CoPt.

65. A composition according to claim 64, wherein the peptide binds specifically to a crystalline surface of CoPt.

66. A composition according to claim 64, wherein the peptide comprises the sequence of NAGDHAN (SEQ ID NO.:12).

67. A composition according to claim 64, wherein the peptide comprises the sequence of SVSVGMKPSPRP(SEQ ID NO.:16).

68. A composition comprising peptide that binds specifically to FePt.

69. A composition according to claim 68, wherein the peptide binds specifically to a crystalline surface of FePt.

70. A composition according to claim 68, wherein the peptide comprises the sequence of SKNSNIL (SEQ ID NO.:13).

71. A composition according to claim 68, wherein the peptide comprises the sequence of HNKHLPSTQPLA (SEQ ID NO.:17).

72. A composition comprising peptide that binds specifically to SmCo5.

73. A composition according to claim 72, wherein the peptide binds specifically to a crystalline surface of SmCo5.

74. A composition according to claim 72, wherein the peptide that binds to SmCo5 comprises the sequence of TKPSVVQ (SEQ ID NO.:14).

75. A composition according to claim 72, wherein the peptide that binds to SmCo5 comprises the sequence of WDPYSHLLQHPQ (SEQ ID NO.:18).

76. A composition comprising peptide that binds specifically to a ferromagnetic surface.

77. A composition according to claim 76, wherein the peptide binds specifically to a crystalline surface of a ferromagnetic surface.

78. A method of isolating a molecule that binds specifically to a magnetic material comprising the steps of:

contacting a library of molecules with a magnetic material;

removing non-binding molecules from the library; and

eluting the bound molecules from the magnetic material.

79. The method of claim 78, further comprising the step of determining the molecular structure of the molecules that bind the magnetic material.

80. The method of claim 78, wherein the molecular library is further defined as comprising a phage library.

81. The method of claim 78, wherein the molecular library is further defined as comprising a phage display library.

82. The method of claim 78, wherein the molecular library is further defined as comprising a combinatorial chemistry library.

83. The method of claim 78, wherein the molecular library is further defined as comprising a peptide library.

84. The method according to claim 78, wherein the magnetic material is ferromagnetic.

85. The method according to claim 78, wherein the molecules comprise amino acid oligomers which specifically bind the magnetic material.

86. A method of preparing a particle film comprising the steps of:

adding a solution of particles to a surface; wherein the particles are synthesized with use of binding molecules;

evaporating the solution of nanoparticles on the surface; and

annealing the particles to the surface to create a film of particles.

87. The method according to claim 86, wherein the particles are magnetic.

88. The method according to claim 86, wherein the particles are ferromagnetic.

89. The method according to claim 86, wherein the particles are nanoparticles.

90. The method according to claim 86, wherein the particles are ferromagnetic nanoparticles.

91. The method of claim 86, wherein the solution of nanoparticles are magnetic nanoparticles in a solvent and are selected from the group consisting of ε-Co, Co, $SmCo_5$, CoPt, FePt, and combinations thereof.

92. The method of claim 86, wherein the solvent is evaporated.

93. The method of claim 86, wherein the surface is a microfabricated solid surface to which molecules may attach through either covalent or non-covalent bonds and selected from the group consisting of Langmuir-Bodgett films, glass, functionalized glass, germanium, silicon, PTFE, polystyrene, gallium arsenide, gold, silver, or any materials comprising amino, carboxyl, thiol or hydroxyl functional groups incorporated onto a surface.

94. The method of claim 86, wherein the annealing is at a temperature of least about 700 degrees Centigrade for at least about 30 minutes under an inert gas.

95. A particle film prepared by the method of claim 86.

96. A method of making a metal material comprising the steps of:

providing a molecule comprising a portion that binds specifically to a metal surface; and

contacting one or more metal material precursors with the molecule under conditions that permit formation of the metal material.

97. The method of claim 96, wherein the formation of the metal material occurs in the presence of a reducing agent.

98. The method according to claim 96, wherein the molecule comprises an amino acid oligomer portion which binds specifically to the metal surface.

99. The method recited in claim 96, wherein the oligomer portion which binds specifically is between about 7 and about 100 amino acids long.

100. The method recited in claim 96, wherein the oligomer portion which binds specifically is between about 7 and about 20 amino acids long.

101. The method of claim 96, wherein the metal material is magnetic.

102. The method of claim 96, wherein the metal material is ferromagnetic.

103. The method of claim 96, wherein the metal material is a particle.

104. The method of claim 96, wherein the metal material is a nanoparticle.

105. The method of claim 96, wherein the metal material is a ferromagnetic nanoparticle and the molecule comprises an amino acid oligomer.

106. A method of making a magnetic material comprising the step of contacting a molecule which binds specifically to the magnetic material with a magnetic material precursor at a temperature of 300°C or below to form the magnetic material.

107. The method according to claim 106, wherein the temperature is 200°C or below.

108. The method according to claim 106, wherein the temperature is 100°C or below.

109. The method according to claim 106, wherein the molecule comprises a peptide which binds specifically to the magnetic material.

110. The method according to claim 106, wherein the molecule comprises an oliogopeptide which binds specifically to the magnetic material.

111. The method according to claim 106, wherein the magnetic material is a crystalline material.

112. The method according to claim 106, wherein the magnetic material is a ferromagnetic material.

113. The method according to claim 106, wherein the magnetic material comprises particles.

114. The method according to claim 106, wherein the magnetic material comprises nanoparticles.

115. The method according to claim 106, wherein the contacting and formation are carried out in solution and the magnetic material does not precipitate out of solution.

116. A method of making a metallic material comprising the step of contacting a molecule which binds specifically to the metallic material with a metallic material precursor at a temperature of 300°C or below to form the metallic material.

117. The method according to claim 116, wherein the temperature is 200°C or below.

118. The method according to claim 116, wherein the temperature is 100°C or below.

119. The method according to claim 116, wherein the molecule comprises a peptide.

120. The method according to claim 116, wherein the molecule comprises an oliogopeptide.

121. The method according to claim 116, wherein the metallic material is a crystalline material.

122. The method according to claim 116, wherein the metallic material is a ferromagnetic material.

123. The method according to claim 116, wherein the metallic material comprises particles.

124. The method according to claim 116, wherein the metallic material comprises nanoparticles.

125. The method according to claim 116, wherein the contacting and formation are carried out in solution and the metallic material does not precipitate out of solution.

126. A composition comprising an oligopeptide and a magnetic material, wherein the oligopeptide is specifically bound to the magnetic material.

127. The composition according to claim 126, wherein the magnetic material is a ferromagnetic material.

128. The composition according to claim 126, wherein the magnetic material comprises magnetic alloy.

129. The composition according to claim 126, wherein the magnetic material comprises particles.

130. The method according to claim 126, wherein the magnetic material comprises nanoparticles.

131. A composition comprising $SmCo_5$ nanoparticles.

132. The composition according to claim 131, wherein the $SmCo_5$ nanoparticles are HCP nanoparticles.

133. A metal material comprising binding molecule-synthesized metal particles.

134. A metal material of claim 133, wherein the particles are magnetic.

135. A metal material of claim 133, wherein the particles are ferromagnetic.

136. A metal material of claim 133, wherein the particles are nanoparticles.

137. A metal material of claim 133, wherein the binding molecule synthesized particles are free from biological molecules by removal by heating.

138. A metal material of claim 133, wherein the metal particles have an aspect ratio greater than 50.

139. A metal material of claim 133, wherein the metal particles are elongated and comprise functionalized regions at either long end.

140. A metal material of claim 133, wherein the metal particles are elongated and have regions at either long end to facilitate binding.

141. A metal material of claim 133, wherein the material is localized prior to heating.

142. A metal material comprised of a collection of binding molecule synthesized metal nanoparticles that are annealed from polycrystalline to single crystalline materials.

143. A metal material comprising of a collection of binding molecule synthesized metal nanoparticles that are synthesized independently from viruses.